

## Trend Study 13B-7-05

Study site name: Steamboat Mesa North.

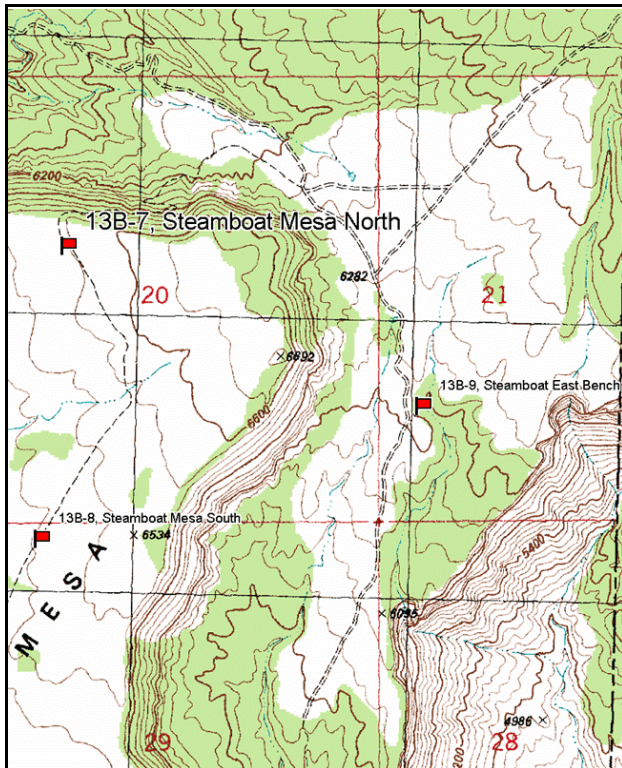
Vegetation type: Chained, Seeded P-J.

Compass bearing: frequency baseline 165 degrees magnetic.

Footmark first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

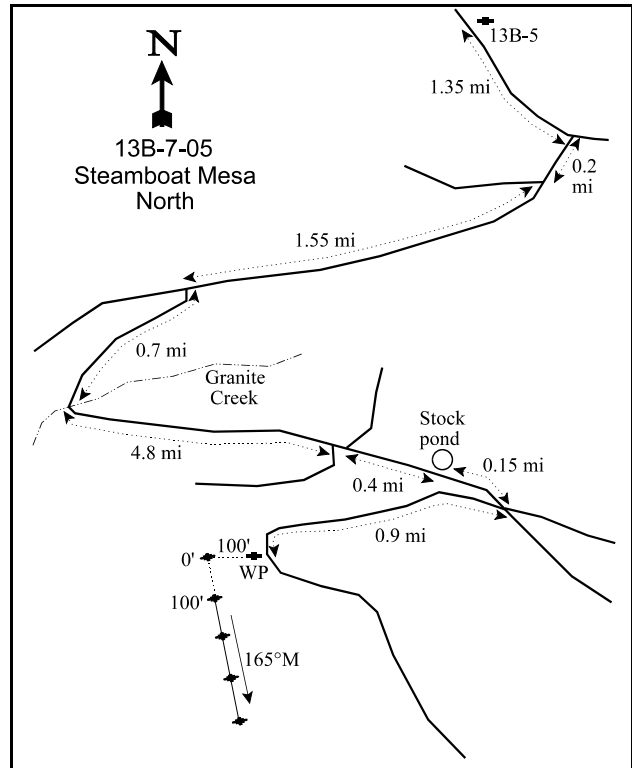
### LOCATION DESCRIPTION

From the Buckhorn Draw transect (13B-5), continue southeast for 1.35 miles to the "Granary" intersection. Turn right and go 0.2 miles to a fork. Stay left and drive 1.55 miles to a road on the left (and turn left. Go down this road 0.7 miles to Granite Creek. Cross the creek and proceed 4.8 miles to a fork. Stay left, then right at another fork which connects back to the main road, traveling 0.4 miles to a stock pond. Continue 0.15 miles to a fork with many branches (the right goes up on Steamboat Mesa). It is 0.9 miles from the fork to the top of Steamboat Mesa and a witness post on the right side of the road. The witness post (a green fence post) is six feet off the road. The 0-foot baseline stake is 100 feet west of the witness post. All the transect posts are rebar.



Map Name: Steamboat Mesa

Township 23S, Range 26E, Section 20



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4295207 N, 666727 E

## DISCUSSION

### Steamboat Mesa North - Trend Study No. 13B-7

Steamboat Mesa is a large flat mesa located in the southeast corner of the Dolores Triangle, just north of the Dolores River and west of the Colorado border. The mesa is surrounded by steep rock cliffs and is accessible only by a rough 4-wheel drive road on the north end. The Steamboat Mesa North study site was set up in a large chaining near the north edge of the mesa. The study is located on a slight slope (3-5%) with a southwest aspect and an elevation of 6,600 feet. Managed by the BLM, this portion of the Steamboat Mesa allotment was two-way chained and seeded in 1968. Crested wheatgrass, four-wing saltbush, big sagebrush, alfalfa, and bitterbrush were seeded. The allotment is grazed by cattle from December through mid-April for 884 AUM's. Key forage and browse species are crested wheatgrass, scattered Wyoming big sagebrush, white stemmed rabbitbrush, green ephedra, and bitterbrush. Pellet group data in 2000 estimated 42 deer days use/acre (104 ddu/ha) and 17 cow days use/acre (42 cdu/ha). In 2005, pellet group data estimated 61 deer and 1 elk day use/acre (150 ddu/ha and 3 edu/ha).

The soil is a moderately shallow, well-drained, sandy clay loam derived from sandstone. It has a mildly alkaline pH of 7.7. Soil depth is variable, from very shallow to moderately deep, with rock scattered throughout the soil profile, and the effective rooting depth on average is almost 12 inches. Phosphorus levels were marginal at 8.7 ppm, where levels below 6 ppm may limit normal plant development and growth in wildland soils (Tiedemann and Lopez 2004). Litter accounted for almost 36% of the relative ground cover until 2005, much of which was left from the chaining. In 2005, this had decreased to 25% of the relative ground cover. Relative vegetation cover was about 25% with about 5 to 9% combined rock and pavement cover until 2000. In 2005, the relative vegetation cover had increased to 30% with 5% combined rock and pavement cover. Relative bare ground cover increased from 23% in 1986 to 40% in 2005. The ratio of bare soil to protective cover has remained almost the same. The erosion condition class determined soil movement as slight in 2005 due to excessive pedestaling around shrubs and perennial grasses, some flow patterns and rills between vegetation, moderate surface litter movement, and some soil movement between perennial species.

The overstory canopy cover from pinyon and juniper trees was 9% in 2000. Point-center quarter from 2000 estimated tree densities at 177 pinyon/acre and 142 juniper/acre. The overstory canopy cover of pinyon and juniper trees in 2005 was 16% with estimated tree densities of 101 pinyon/acre and 150 juniper/acre. Comparing pictures from 2000 and 2005 along with the point-center quarter data show many pinyon trees died due to drought conditions between 2000 and 2005. True mountain mahogany, antelope bitterbrush, green ephedra, rubber rabbitbrush, Wyoming big sagebrush, black sagebrush, Utah serviceberry, and fourwing saltbush, although all found at low densities, have displayed good vigor and light hedging. Green ephedra and fourwing saltbush have showed moderate hedging with some in poor condition. This is generally normal for these two species where they are found in low densities.

Crested wheatgrass is the key forage species for cattle. It has accounted for nearly all of the grass cover and forms large, distinct patches over the site. Sum of nested frequency was highest in 2000. Cheatgrass is the only other grass species that is found with much abundance. It declined significantly in frequency in 2000, but increased in 2005. Other important forage grasses are Indian ricegrass, needle-and-thread grass, and mutton bluegrass. A variety of native perennial forbs are found on the site, although none are particularly important in terms of forage value on winter range. Most common are increasers such as rock goldenrod, Hoods phlox, and hairy gold aster.

### 1986 APPARENT TREND ASSESSMENT

Juniper and pinyon are becoming more dominant on this site and will begin to impact the more desirable browse species. However, there is a potential for the other shrubs to increase. The BLM resource management plan

addresses the need to “maintain” this chaining. Big game habitat could be improved if maintenance involved tree removal to release the more desirable browse species. The variety of grasses and forbs currently provide good spring forage. The long-term vegetation trend would be considered down without intervention. The soil trend appears stable at this time.

#### 1995 TREND ASSESSMENT

Bare ground has increased since 1986 although there are no signs of active erosion. The increase in bare ground is due to the lack of litter produced with drier conditions in recent years. Therefore, the soil trend is stable. Currently, grasses provide good spring forage. There is a wide variety of annual species found on the site as well. Most of the cheatgrass is found in large patches with crested wheatgrass scattered throughout. Although nested frequency for perennial forb species has increased, most are increasers and of little forage value. The herbaceous understory trend is up slightly, although a different composition may be desirable. Pinyon and juniper combine for 305 trees/acre. Browse species are scattered throughout in low densities with most showing little utilization. This leads to a stable browse trend. The Desirable Components Index rated this site as fair with a score of 27 due to fair perennial grass cover, good perennial forb cover, no recruitment of shrubs, low browse cover, and low annual grass cover.

##### TREND ASSESSMENT

soil - stable (0)

browse - stable (0)

herbaceous understory - slightly up (+1)

winter range condition (DC Index) - Fair (27) Lower Potential scale

#### 2000 TREND ASSESSMENT

Bare ground has increased slightly again since 1995, yet the ratio of bare soil to protective cover is almost unchanged and there are no signs of active erosion. The increase in bare ground is due to the exceptionally dry year we have just experienced. Therefore, the soil trend is stable. Currently, grasses provide good spring forage. There is a wide variety of annual species found on the site, although they are in reduced numbers with the drought. Nested frequency for perennial forb species has decreased, while that for the perennial grasses increased. Cheatgrass also decreased significantly. Since forbs only make up 15% of the herbaceous cover, the herbaceous understory trend is considered up slightly for the perennial grasses, with the composition shifting to more perennial species. Pinyon and juniper density appears stable. Browse species are scattered throughout in low densities with most showing little utilization. This leads to a stable browse trend. The Desirable Components Index rated this site as fair with a score of 36 due to excellent perennial grass cover, fair perennial forb cover, no recruitment of shrubs, low browse cover, and no annual grass cover.

##### TREND ASSESSMENT

soil - stable (0)

browse - stable (0)

herbaceous understory - slightly up (+1)

winter range condition (DC Index) - Fair (36) Lower Potential scale

#### 2005 TREND ASSESSMENT

The soil trend is slightly down. The ratio of protective ground cover (vegetation, litter and cryptogams) to bare ground is nearly the same as in 2000. The relative cover of bare ground increased from 30% in 2000 to 40% in 2005, but the relative vegetation cover also increased from 25 to 30%. Most of the increase in bare soil is because of the loss of litter cover. The trend for browse is stable. The browse species on this site have low densities. Bitterbrush increased 71% from 2000 to 2005, an increase from 40 to 140 plants/acre. The

population of green ephedra in 2000 consisted of 400 plants/acre and increased to 500 plants/acre in 2005. The percentage of young individuals increased from 5% in 2000 to 40% in 2005. The percentage of decadent ephedra individuals decreased from 30% in 2000 to 16% in 2005. The herbaceous understory trend is stable. There was a slight increase in the nested frequency of perennial species, despite the increase in cheatgrass. The nested frequency of perennial forbs increased 50% from 2000 to 2005. The nested frequency of annual grasses was 48 times higher from 2000 to 2005. This increase in cheatgrass affects the trend negatively, but not enough to justify a slightly down trend. The Desirable Components Index rated this site as fair with a score of 37 due to excellent perennial grass cover, fair perennial forb cover, no recruitment of shrubs, low browse cover, and no annual grass cover.

#### TREND ASSESSMENT

soil - slightly down (-1)

browse - stable (0)

herbaceous understory - stable (0)

winter range condition (DC Index) - Fair (37) Lower Potential scale

#### HERBACEOUS TRENDS --

Management unit 13B, Study no: 7

Type	Species	Nested Frequency				Average Cover %		
		'86	'95	'00	'05	'95	'00	'05
G	Agropyron cristatum	a155	b228	c277	b245	9.01	16.29	17.79
G	Bromus tectorum (a)	-	b163	a3	b125	1.35	.03	2.10
G	Oryzopsis hymenoides	c52	ab15	a-	b21	.14	.00	.44
G	Poa bulbosa	-	-	-	3	-	-	.15
G	Poa fendleriana	4	4	-	-	.04	-	-
G	Poa secunda	a-	ab3	ab9	b12	.03	.04	.08
G	Sitanion hystrix	b28	a-	a2	a3	-	.03	.15
G	Sporobolus cryptandrus	-	-	1	-	-	.03	-
G	Stipa comata	8	-	5	1	-	.03	.01
G	Vulpia octoflora (a)	-	a5	a-	b19	.01	-	.06
Total for Annual Grasses		0	168	3	144	1.37	0.03	2.16
Total for Perennial Grasses		247	250	294	285	9.23	16.43	18.63
Total for Grasses		247	418	297	429	10.60	16.47	20.79
F	Agoseris glauca	-	-	-	1	.01	-	.00
F	Allium sp.	-	3	-	-	.00	-	-
F	Astragalus convallarius	7	1	1	8	.01	.03	.45
F	Astragalus mollissimus	-	6	1	1	.01	.00	.03
F	Calochortus nuttallii	-	8	-	4	.01	-	.01
F	Chenopodium fremontii (a)	-	-	-	4	-	-	.01
F	Crepis acuminata	-	-	-	3	-	-	.00
F	Cryptantha sp.	-	4	-	2	.01	-	.03
F	Cymopterus sp.	a-	b16	a-	b15	.04	-	.11

Type	Species	Nested Frequency				Average Cover %		
		'86	'95	'00	'05	'95	'00	'05
F	Descurainia pinnata (a)	-	<sub>a</sub> 4	<sub>a</sub> -	<sub>b</sub> 29	.01	-	.31
F	Draba nemorosa (a)	-	<sub>b</sub> 96	<sub>a</sub> -	<sub>b</sub> 87	.21	-	.39
F	Erodium cicutarium (a)	-	<sub>a</sub> 8	<sub>ab</sub> 9	<sub>b</sub> 21	.16	.41	.45
F	Erigeron pumilus	<sub>a</sub> 2	<sub>b</sub> 19	<sub>b</sub> 13	<sub>c</sub> -	.04	.05	-
F	Gilia hutchinifolia (a)	-	<sub>b</sub> 28	<sub>a</sub> -	<sub>c</sub> 42	.07	-	.21
F	Haplopappus acaulis	3	7	3	-	.01	.00	-
F	Heterotheca villosa	<sub>a</sub> -	<sub>b</sub> 16	<sub>b</sub> 16	<sub>c</sub> 39	.21	.29	.82
F	Hymenoxys acaulis	-	-	-	7	-	-	.16
F	Lappula occidentalis (a)	-	<sub>b</sub> 43	<sub>a</sub> -	<sub>c</sub> 82	.15	-	1.49
F	Lactuca serriola	-	6	-	-	.15	-	-
F	Lepidium densiflorum (a)	-	<sub>b</sub> 24	<sub>a</sub> -	<sub>b</sub> 33	.19	-	.20
F	Lesquerella sp.	-	-	-	1	-	-	.03
F	Lychnis drummondii	-	-	-	-	-	-	.00
F	Machaeranthera grindelioides	<sub>a</sub> -	<sub>b</sub> 21	<sub>a</sub> -	<sub>a</sub> 5	.04	-	.06
F	Medicago sativa	-	3	2	-	.00	.03	-
F	Penstemon sp.	-	1	3	1	.00	.15	.03
F	Petradoria pumila	37	41	32	26	2.21	1.35	1.08
F	Phlox hoodii	<sub>b</sub> 28	<sub>b</sub> 32	<sub>ab</sub> 13	<sub>a</sub> 11	.49	.11	.07
F	Phlox longifolia	-	2	-	-	.00	-	-
F	Plantago patagonica (a)	-	<sub>a</sub> 3	<sub>a</sub> -	<sub>b</sub> 32	.01	-	.30
F	Polygonum douglasii (a)	-	3	-	-	.00	-	.00
F	Ranunculus testiculatus (a)	-	<sub>a</sub> 3	<sub>a</sub> -	<sub>b</sub> 38	.01	-	.18
F	Schoenocrambe linifolia	<sub>a</sub> -	<sub>b</sub> 17	<sub>a</sub> -	<sub>a</sub> -	.07	-	.16
F	Sisymbrium altissimum (a)	-	<sub>b</sub> 27	<sub>a</sub> -	<sub>a</sub> 5	.07	-	.33
F	Sphaeralcea coccinea	<sub>a</sub> -	<sub>b</sub> 13	<sub>b</sub> 12	<sub>b</sub> 20	.13	.05	.18
F	Streptanthus cordatus	-	3	-	-	.00	-	-
F	Tragopogon dubius	<sub>b</sub> 14	<sub>ab</sub> 5	<sub>a</sub> -	<sub>a</sub> -	.02	-	-
Total for Annual Forbs		0	239	9	373	0.88	0.41	3.90
Total for Perennial Forbs		91	224	96	144	3.53	2.07	3.27
Total for Forbs		91	463	105	517	4.42	2.48	7.17

Values with different subscript letters are significantly different at alpha = 0.10

## BROWSE TRENDS --

Management unit 13B, Study no: 7

Type	Species	Strip Frequency			Average Cover %		
		'95	'00	'05	'95	'00	'05
B	Amelanchier utahensis	0	0	0	-	-	.38
B	Artemisia nova	0	1	1	-	-	-
B	Artemisia tridentata wyomingensis	0	1	1	-	.38	.38
B	Atriplex canescens	1	1	1	-	.00	-
B	Chrysothamnus nauseosus	4	7	6	.98	1.62	.33
B	Ephedra viridis	9	8	7	1.35	.86	.57
B	Gutierrezia sarothrae	0	11	4	-	.02	.00
B	Juniperus osteosperma	0	6	3	2.70	3.67	2.62
B	Leptodactylon pungens	4	4	5	.01	.18	.15
B	Opuntia sp.	2	2	3	.03	.00	-
B	Pinus edulis	0	6	5	4.77	4.36	3.08
B	Purshia tridentata	1	1	2	.15	.30	.18
Total for Browse		21	48	38	9.99	11.42	7.69

## CANOPY COVER, LINE INTERCEPT --

Management unit 13B, Study no: 7

Species	Percent Cover	
	'00	'05
Artemisia tridentata wyomingensis	-	.35
Atriplex canescens	-	.21
Chrysothamnus nauseosus	-	.41
Ephedra viridis	-	.26
Juniperus osteosperma	4.59	8.56
Pinus edulis	4.19	7.21
Purshia tridentata	-	.58

## POINT-QUARTER TREE DATA --

Management unit 13B, Study no: 7

Species	Trees per Acre	
	'00	'05
Juniperus osteosperma	142	150
Pinus edulis	177	101

Average diameter (in)	
'00	'05
3.3	5.4
2.6	4.2

BASIC COVER --

Management unit 13B, Study no: 7

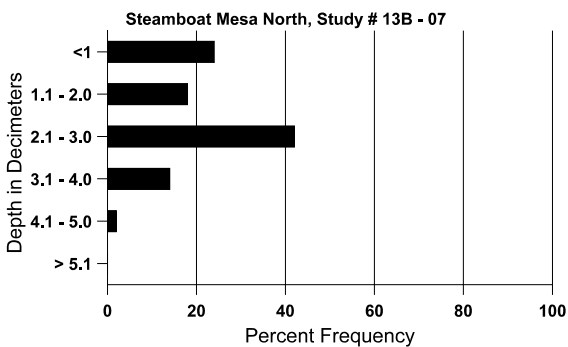
Cover Type	Average Cover %			
	'86	'95	'00	'05
Vegetation	11.25	26.70	33.01	34.45
Rock	.25	4.64	6.08	3.90
Pavement	0	.13	2.52	1.02
Litter	65.00	37.74	47.32	28.86
Cryptogams	.25	.53	2.33	.78
Bare Ground	23.25	33.34	38.60	45.54

SOIL ANALYSIS DATA --

Herd Unit 13B, Study # 7, Study Name: Steamboat Mesa North

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	ppm P	ppm K	dS/m
11.5	59.0 (12.4)	7.7	56.6	25.1	21.3	1.9	8.7	92.8	0.7

## Stoniness Index



PELLET GROUP DATA --

Management unit 13B, Study no: 7

Type	Quadrat Frequency		
	'95	'00	'05
Rabbit	18	32	29
Elk	1	-	5
Deer	19	9	30
Cattle	6	8	5

Days use per acre (ha)	
'00	'05
-	-
-	1 (3)
42 (105)	61 (150)
17 (43)	-

## BROWSE CHARACTERISTICS --

Management unit 13B, Study no: 7

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<b>Amelanchier utahensis</b>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	29/62
00	0	-	-	-	-	-	0	0	-	-	0	63/76
05	0	-	-	-	-	-	0	0	-	-	0	34/58
<b>Artemisia nova</b>												
86	0	-	-	-	-	-	0	0	0	-	0	-/-
95	0	-	-	-	-	-	0	0	0	-	0	-/-
00	20	-	-	20	-	-	0	0	0	-	0	5/13
05	20	-	-	-	20	20	0	100	100	-	0	7/24
<b>Artemisia tridentata wyomingensis</b>												
86	66	-	-	66	-	-	0	0	0	-	0	22/19
95	0	-	-	-	-	-	0	0	0	-	0	9/14
00	20	-	-	20	-	20	0	100	0	-	0	9/15
05	20	-	-	-	20	20	0	100	100	-	0	14/14
<b>Atriplex canescens</b>												
86	66	-	-	-	66	-	0	0	100	-	0	-/-
95	20	-	-	20	-	-	0	100	0	-	0	38/41
00	20	-	-	-	20	-	0	0	100	-	0	34/79
05	40	-	20	-	20	-	0	50	50	-	0	34/49
<b>Cercocarpus montanus</b>												
86	0	-	-	-	-	-	0	0	-	-	0	-/-
95	0	-	-	-	-	-	0	0	-	-	0	-/-
00	0	-	-	-	-	-	0	0	-	-	0	-/-
05	0	-	-	-	-	-	0	0	-	-	0	55/32
<b>Chrysothamnus nauseosus</b>												
86	0	-	-	-	-	-	0	0	0	-	0	-/-
95	100	-	-	100	-	-	0	0	0	-	0	27/34
00	140	-	-	120	20	-	29	0	14	-	0	37/45
05	120	-	-	60	60	20	17	17	50	17	17	24/30
<b>Ephedra viridis</b>												
86	133	-	-	133	-	-	0	100	0	-	0	18/11
95	540	-	180	300	60	60	22	7	11	-	0	17/22
00	400	-	20	260	120	-	15	60	30	5	5	21/29
05	500	-	220	200	80	20	0	20	16	8	8	25/38

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Gutierrezia sarothrae</i>												
86	<b>66</b>	333	-	-	66	-	0	0	100	-	0	-/-
95	<b>0</b>	-	-	-	-	-	0	0	0	-	0	7/15
00	<b>560</b>	-	40	460	60	20	0	0	11	4	4	5/10
05	<b>140</b>	20	-	140	-	-	0	0	0	-	0	11/15
<i>Juniperus osteosperma</i>												
86	<b>66</b>	-	-	66	-	-	0	0	-	-	0	83/58
95	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
00	<b>120</b>	-	20	100	-	-	0	0	-	-	0	-/-
05	<b>60</b>	-	-	60	-	-	0	0	-	-	0	-/-
<i>Leptodactylon pungens</i>												
86	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
95	<b>80</b>	-	-	80	-	-	0	0	-	-	0	5/10
00	<b>120</b>	-	-	120	-	-	0	0	-	-	0	5/10
05	<b>120</b>	-	-	120	-	-	0	0	-	-	0	4/8
<i>Opuntia</i> sp.												
86	<b>0</b>	-	-	-	-	-	0	0	0	-	0	-/-
95	<b>60</b>	-	20	40	-	-	0	0	0	-	0	5/18
00	<b>60</b>	-	20	40	-	-	0	0	0	-	0	4/10
05	<b>60</b>	-	20	20	20	-	0	0	33	-	0	4/17
<i>Pinus edulis</i>												
86	<b>333</b>	-	200	133	-	-	0	0	-	-	0	81/47
95	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
00	<b>120</b>	-	-	120	-	-	0	0	-	-	0	-/-
05	<b>100</b>	-	-	100	-	20	0	0	-	-	20	-/-
<i>Purshia tridentata</i>												
86	<b>0</b>	-	-	-	-	-	0	0	-	-	0	-/-
95	<b>20</b>	-	-	20	-	-	0	0	-	-	0	20/40
00	<b>40</b>	-	-	40	-	-	0	100	-	-	0	24/89
05	<b>140</b>	-	-	140	-	-	0	100	-	-	0	12/37